

DOCUMENT RESUME

ED 261 771

PS 015 227

AUTHOR Ryan, Kathleen; And Others
TITLE Environmental Correlates of Optimal Child Development: A Look at the Maternal Social Support System Moderating Levels of Mother/Child Stress and Home Stimulation.
PUB DATE Apr 85
NOTE 18p.; Paper presented at the Spring Convention of the Ohio Psychological Association (April, 1985).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Child Development; *Family Environment; High Risk Persons; Infants; Longitudinal Studies; *Lower Class; Mothers; *Social Support Groups; Socioeconomic Status; *Stimulation; *Stress Variables

ABSTRACT

Pre- and post-natal medical, financial, demographic, and maternal social support data were collected from 220 lower socioeconomic status (SES), "high risk" mothers and their newborn infants. Additional data were obtained later from a subsample of 19 boys and 19 girls between 18 and 24 months of age and their mothers. Mothers ranged in age from 15 to 42 years, with a mean age of 24 and a mean education level of 11.4 years. There were 25 caucasian and 13 minority families in the subsample. Measures administered to participants during 2-hour in-home visits included the Bayley Scales of Infant Development (Motor and Mental), the Maternal Social Support Index, the Inventory of Home Stimulation, the Parenting Stress Inventory, the Shipley Institute of Living Scale - Vocabulary Test, and a demographic questionnaire. Current maternal social support was correlated positively with home stimulation and accounted for the largest portion of the variance, in comparison to race and income at time of birth. Mothers who reported high stress and low support provided significantly lower amounts of home stimulation than families characterized by any other combination of support/stress factors. No significant predictors of Bayley development scores or of cognitive development were found. (RH)

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OHIO PSYCHOLOGICAL ASSOCIATION
SPRING CONVENTION, APRIL, 1985
POSTER SESSION

ENVIRONMENTAL CORRELATES OF
OPTIMAL CHILD DEVELOPMENT

A Look at the
Maternal Social Support System
Moderating levels of
Mother/Child Stress and Home Stimulation

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John Pascoe
Univ. of Michigan
John Chessare
Medical College of Ohio

Several graduate students assisted with the home interviews
and testing. Our sincere thanks are extended to: D. Cooley,
A. Krutsch, M. Reed, S. Snyder, and A. Staubsinger.

INTRODUCTION

When looking at environmental correlates of optimal cognitive, emotional, and social growth and development from infancy through later childhood, socioeconomic status (SES) is consistently reported as the most powerful predictive factor (e.g., Anastasi, 1958; Plowden, 1967). In fact, membership in the lower SES groups alone typically warrants being labelled "high risk" for many child developmental and maltreatment problems. However, as has been frequently noted (e.g., Bloom, 1964), social class rarely explains more than 25 percent of the variance in measures of child development (e.g., school performance, IQ scores). And researchers are now reporting and emphasizing wide individual differences even within the various SES groupings with respect to child rearing practices (e.g., Pavenstedt, 1968).

The primary reason for focusing on environmental correlates of development is that the environment is more amenable to change than biological make-up or purely economic factors. What is needed is an analysis of which environmental variables are related to actual incidences of developmental or child-care problems, the exploration of the possible individual differences within lower SES families, and an incorporation of those environmental factors more amenable to

change into an intervention program.

In developing intervention programs, targeting as large a population as all lower SES families is unrealistic and impractical. The use of sensitive measures could decrease the size of the "at risk" population, potentially resulting in a smaller sample with a higher incidence of maltreatment or poor development. This could contribute to the more efficient use of available resources.

Walberg & Marjoribanks (1976), in their review of research on child cognitive development and the family setting, conclude that the effects of SES factors on cognitive performance are likely mediated **completely** by environment process variables. Therefore, careful assessment of the early home environment should prove useful in identifying potential obstructions to optimal child development. However, it is cautioned that the effects of impoverished home environments during a child's early years may not be manifested until later years.

Two general explanations have been formulated to account for this. The first one emphasizes the time lag between when correlates of poor cognitive development first begin operating in the environment as opposed to when their effects are first consistently noticed or brought to professionals' attention. It seems likely that variables such as amount of stress parents experience and amount of

outside support they have available to them would affect what attitudes and behaviors are prevalent within the home setting. That is, parents who experience high levels of stress without appropriate outside support or outlets, may be channeling their energies into reducing the sources of stress or, at more of an extreme, may simply experience feelings of being so overwhelmed that they are unable to act at all. This could result in a lack of desire, attention, or ability in providing physical, social, and intellectual stimulation for the child.

In contrast, parents who have social supports available to them may be less likely to be overwhelmed by any particular stressor, and may, as a result, be better able to deal with the pressures of being a parent. For example, social support might help a stressed parent by providing needed temporary "relief" from child care responsibilities, or support for inhibiting abusive impulses, or time to provide positive stimulation to the child. Thus, social support might be conceptualized as a "buffer" which improves an individual's competencies in dealing with stress. Recent research offer support for this "buffer" hypothesis (Cobb, 1976; Pascoe, Loda, Jeffries, 1981; Pascoe, Walsh-Clifford, Earp, 1982; Pascoe & Earp, 1984).

While high levels of stress and low levels of support

may be manageable on a short-term basis, as they become perceived as more permanent lifestyle characteristics, the interest/energy/motivation for coping and still providing a pleasant and stimulating environment for the child is likely to gradually decrease over time. Stress and lack of support may have cumulative, longterm effects.

A second possible explanation for why effects of home environment are not immediately recognizable may be the lack of sensitivity in the measurements used to test children's development at the early ages. Caldwell & Bradley (1979) note that variables which influence intellectual development and learning ability are likely operating during the preverbal years, but just do not show up on infant developmental test scores which reflect mainly sensorimotor development. Some research data support this hypothesis. A study by Elardo, Bradley & Caldwell (1975) found that ratings of home environments assessed prior to a child's first year show a higher correlation with that child's three year IQ than with the infant development scores attained prior to the first year.

To summarize, the potentially delayed effects of some variables operating in the environment on intellectual development, as well as the inability to test verbal skills (an important component of cognitive ability) at a 0 to 2 year level, might both contribute to finding a

nonsignificant relationship between early home stimulation and intellectual development. However, such a relationship may surface at a later testing. Therefore, the optimal research methodology to adopt to assess effects of environmental process variables on ongoing development is a longitudinal approach.

OVERVIEW OF THE PRESENT PROJECT

The present study is one part of a longitudinal investigation of maternal social support and its relationship to mother/child stress, amount of stimulation provided the child, and the child's cognitive development. This paper will focus on only a subset of the available data, with particular emphasis on the cognitive development of the child. Therefore, a more specific and narrowed interest is whether any of the variables assessed both prenatally and again 18-24 months later might be predictive of infant mental or motor development scores.

Based on past research findings of a significant positive relationship between home stimulation and intellectual development, it is of interest to determine whether a similar relationship is apparent with the targeted population of "lower SES" families at this early 18-24 month interval.

METHOD

In 1981 and 1982, pre- and post- natal medical, financial, demographic, and maternal social support data were collected from 220 lower SES, "high risk" mothers and their newborn infants served consecutively by a community obstetrics-gynecology clinic in Northwest Ohio. It is well established in the literature and now generally accepted that lower SES families warrant the label of "at high risk" for subsequent mother-child relationship problems and poor development simply because of class membership alone. Further support for the label was found for the subjects in this ongoing study. An analysis of the first 100 children (the oldest members) found that 14 families had already been referred to a children's protective services board for investigation of abuse/neglect. Considering the possibilities that some cases of abuse went unreported, that some infants may have "failed to thrive", and that some families may have relocated and thus would not be reported to the children's services in the particular locale monitored, the identification of 14 percent for investigation is consistent with considering this a "high risk" sample.

Data in the present study was obtained from a new subsample of 38 of the youngest children and their mothers.

Between February and June, 1984, an attempt was made to locate all families whose children were younger than two years of age. Out of the 91 who met these age qualifications, 58 were successfully located. An initial letter was sent requesting participation in the present study. This was followed by a phone call and subsequently, written consent was obtained. Of the 58 families successfully located, 38 voluntarily agreed to participate. A token reimbursement of five dollars was made to all participants.

The mothers ranged in age from 15 to 42 years, with a mean age of 24, and a mean education level of 11.4 years. The children, 19 girls and 19 boys, ranged from 18 to 24 months. There were 25 caucasian and 13 minority (Black or Hispanic) families. The mean range of annual family income was \$5,000 - 10,000, and was usually government subsidized (Welfare, food stamps, aid to dependent children).

Teams of two trained psychology graduate students met individually with each mother and child in a two-hour, in-home visit. Although a variety of measures were administered, only the following had direct relevance to this present project.

MEASURES:

1. BAYLEY SCALES OF INFANT DEVELOPMENT (MOTOR AND MENTAL)
Standardized indices of early child development.
Yielded two developmental quotients - the motor and mental scores. Mean = 100, standard deviation = 15.
(Bayley, 1969)
2. MATERNAL SOCIAL SUPPORT INDEX (MSSI)
Standardized interview,
subscales measure mother's perceptions of:
-- daily task sharing among family members,
-- satisfaction with adult relationships,
-- availability of emergency help,
-- degree of community involvement.
(Pascoe, Walsh-Clifford, & Earp, 1982)
3. INVENTORY OF HOME STIMULATION (IHS)
Majorly observational index of stimulation and social interaction. Six subscales measure:
-- emotional and verbal responsivity of mother,
-- avoidance of restriction and punishment,
-- organization of physical and temporal environment,
-- provision of appropriate play materials,
-- maternal involvement with child,
-- opportunities for variety in daily stimulation.
(Caldwell, Elardo, & Bradley, 1975)
4. PARENTING STRESS INVENTORY (PSI)
120 item questionnaire. Measures mother's perceptions of three domains of stress: maternal, child, and general life stress.
(Abidin, 1983)
5. SHIPLEY INSTITUTE OF LIVING SCALE - VOCABULARY TEST
40 item vocabulary test, designed to measure intellectual impairment, demands recognition of word synonyms. Mental age equivalents are derived.
(Shipley, 1976)
6. DEMOGRAPHIC QUESTIONNAIRE
Assessed parents' ages, educational levels; income; employment, marital, and health status; and family characteristics.

RESULTS

Home stimulation provided children at young ages has been reported to be predictive of subsequent intellectual development. Therefore, the first question of interest in this study was whether any of the variables assessed were predictive of home stimulation scores. To determine this, a stepwise regression analysis was run and results indicated that a significant proportion of the variance (35%) in IHS scores was accounted for by three variables. Current maternal social support was correlated positively with home stimulation and accounted for 15.8%, race accounted for an increment of 11.5% (higher home stimulation for caucasian as contrasted to minority families), and income at time of birth accounted for an increment of 7.7% of the variance.

If in fact home stimulation would be a key factor in contributing to subsequently assessed intellectual development, it is important to look more closely at the variables that impact on home stimulation and which also are reasonably amenable to change. As noted earlier, it has been speculated that social supports may act to moderate the degree of stress experienced by parents and facilitate their ability to provide appropriate amounts of stimulation to the child. To examine this possibility more closely, a 2 X 2 (stress x support) analysis of variance

(ANOVA) on home stimulation scores was computed and resulted in significant main effects ($F = 4.12$, $F = 4.63$, respectively; $p \leq .05$).

The subjects were divided into clinically low (MSSI ≤ 10) versus high social support by a quartile split and into high/low stress by a median split on the PSI. (It is notable that in using a PSI median split, the high stress group in this sample exceeded the 75 percentile of stress scores obtained by the national normative sample for the PSI).

An inspection of the group means (high/low stress; high/low support) reveals that three groups provided similar levels of home stimulation in contrast to only one group that provided significantly lower levels of stimulation (Refer to Table 1). The group of families characterized by high stress and low social support (cell III) score particularly low on the Home Stimulation Inventory.

As would be expected, this is in contrast to the group of families who are experiencing low stress and high support (cell II). However, it is also in contrast to families who either are experiencing similarly high levels of stress, but who have high levels of support (cell IV), or to the group who are relatively lacking in support but who are not particularly stressed (cell I). To summarize

MATERNAL SOCIAL SUPPORT INDEX (MSSI)

		LOW	HIGH	
PARENTAL STRESS INVENTORY (PSI)	LOW	35.00 (n= 3) I	36.25 (n=16) II	36.05 (n=19)
	HIGH	27.83 (n= 6) III	35.25 (n=12) IV	32.78 (n=18)

TABLE 1. SCORES ON THE INVENTORY OF HOME STIMULATION

Subjects are divided by a quartile split (0-25/26-100 on the MSSI and by a median split on the PSI.

then, the mothers who report high stress and low support provide significantly lower amounts of home stimulation than any of the other combinations of support/stress.

The second question of interest is whether any of the assessed variables, but especially home stimulation, could predict mental or motor development. To determine this, two stepwise regression analyses were run. The first one set Bayley mental development score as the dependent variable; the second set Bayley motor development score as the dependent variable. Independent variables entered into the prediction equation included: income at birth and at present; mother's education level; father's education level; race; Shipley; MSSSI at birth and at present; PSI; HSI. None of these was a significant predictor of either Bayley development score. Further exploratory analyses revealed no significant predictors of cognitive development.

CONCLUSIONS

This project is one aspect of an ongoing longitudinal study. While conclusions must be tentative because of limited sample size, magnitude of the experimental findings, and the need for cross-validation, the results lead to cautious speculations regarding primary prevention efforts with some groups of "at risk" families. It seems that home stimulation (and theoretically child development) may be increased/improved by providing social supports and outlets to mothers of young children. Results of this study suggest that maternal social support likely acts to moderate the negative effects of high mother/child stress, resulting in more appropriate levels of stimulation being provided the child. These supports may range from temporary respite care during emergencies to more stable long-term resources such as regular day care facilities, supportive counseling on an individual basis or in group milieu, or socialization or parent training groups for mother.

It may be most helpful to provide these supports - not after problems have been identified - but rather during the very early years of childhood growth and development. This may be especially helpful for lower SES families where stress levels are likely to be higher than the national average.

Although no variables --and in particular, not home

stimulation -- were predictive of motor or mental development, the investigators are nonetheless reluctant to make a broad conclusive statement about the lack of a relationship between environmental process variables and cognitive development. It is possible that some of the measures used currently may predict subsequent IQ scores, even though they are not significantly predictive of infant development at the current 18-24 month interval. This relationship may likely become apparent at a later time for two reasons. First, the effects of some variables (e.g., support, stress) take time to develop and accumulate. Therefore, they may begin to be realized and noticeably impact on cognitive development only after the child has been functioning in the environment over an extended time period. Secondly, variables which influence intellectual development and learning ability are likely operating during the preverbal years, but do not show up on infant development test scores which reflect mainly sensorimotor development.

Follow-up of these same families is currently in progress. Analysis of the relationship between home stimulation provided at 18-24 months and IQ assessed at 30-36 months is planned.

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